CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1998

DateRun: 07/14/1998

Experimenters: Jason Marshall

ClientType: Aluminum Job Shop

ProjectNumber: Project #1

Substrates: Aluminum

PartType: Coupon

Contaminants: Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil

Cleaning Methods: Immersion/Soak

Analytical Methods: Black light, Gravimetric

Purpose: Evaluate cleaners using increased time and concentration.

Experimental Procedure: Three cleaners were selected from the previous experiment based on cleaning efficiencies. Five and 10 percent solutions were made into 500 mL beakers using DI water. Each cleaner was heated to 130 F on a hot plate. Eighteen pre-weighed coupons were over contaminated with the oil using a hand-held swab. The contaminated coupons were weighed again. Three coupons were placed into each cleaner for 15 minutes with stir-bar agitation. Parts were rinsed in tap water at 120 F for 30 seconds. After the coupons air dried, final weights were measured. Coupons were then view under a black light.

SUBSTRATE MATERIAL: Al #202-3003 H-14
CONTAMINANTS: Oil

Results: With the amount of contaminant remaining on all coupons, the requested analysis of the cleanliness was limited to gravimetric and black light fluorescence. Table 1 list the cleaning efficiencies of the three cleaners selected.

Table 1. Cleaning Efficiencies at 15 minutes

	5%			10%		
	Simple Green	WR Grace	Calgon	Simple Green	WR Grace	Calgon
Coupon 1	68.8	47.7	77.9	80.3	83.6	84.4
Coupon 2	74.8	82.3	83.5	69.5	83.9	83.7
Coupon 3	45.3	64.8	57.2	69.8	82	78.2
Ave	63	64.9	72.9	73.2	83.2	82.1
Std Dev	15.6	17.3	13.9	6.15	1.02	3.4

From the table, the increased time had negative results on the 5% concentrations and little to no effect on the 10% concentrations. The 10% concentration cleaners cleaned about the same as the previous experiment (80.5, 81.6, and 79.0%).
Using the black light fluorescence, the contaminant was found to be redepositing onto the top and back of the coupons in both experiments.

Summary:

Substrates:	Aluminum
Contaminants:	Cutting/Tapping Fluids, Lubricating/Lapping Oils, Oil

Company Name:	Product Name:	Conc.:	Efficiency:	Effective:	Observations:
Simple Green	Concentrated Industrial Strength Cleaner and Degreaser	5	63.00	☐	
Simple Green	Concentrated Industrial Strength Cleaner and Degreaser	10	73.20	☐	
Magnaflux	Daraclean 282	5	64.90	☐	
Magnaflux	Daraclean 282	10	83.20	☐	
Calgon Corporation	Geo Guard 2215	5	72.90	☐	
Calgon Corporation	Geo Guard 2215	10	82.10	☐	

Conclusion:

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The increase in time and concentrations did little to improve the cleaning efficiencies of the three cleaners. Possible further testing could be performed using a semi-aqueous cleaner instead of the aqueous cleaners tested.